

Examiner Arguments and Applicant Responses**Examiner Argument**

Once again, Applicant refused to amend any claims or file an appeal brief, and presented arguments against the rejections instead. Most arguments have been repeated from the prior amendments. Once again, Applicant's amendment and declarations have been reviewed and it's concluded that this application is not allowable. The Examiner strongly suggests that Applicant should either amend his claims or file an appeal brief to advance prosecution of this application following this Office Action because it seems Applicant keeps on repeating the same arguments and declarations which have been well addressed before.

Applicant's Response

Applicant appreciates time of the Examiner to review Applicant's Office Action Response and formulate the Examiner's argument. Applicant respects and appreciates the Examiner's suggestion; however, Applicant asks that the Examiner review Applicant's submitted argument and claim amendments. Applicant respectfully presents that it is Applicant's right not to elect claim limitations chosen by the Examiner or to appeal if not so chosen by Applicant.

Should Applicant be required to file an appeal because the Examiner does not review the application based upon the merits, Applicant will be improperly and significantly delayed in prosecution of the instant application. Applicant respectfully presents that such is not the Mission of the USPTO. Applicant respectfully asks that the rather hostile and argumentative tone of these communications be reduced so as to be more productive.

Applicant, respectfully asks the Examiner to review the application based upon the merits.

As further evidence of inventive step, non-obviousness and allowability, since the Examiner's Office Action, similar claims have been awarded or are in the process of allowance in Canada, Germany and Australia. Therefore and since Applicant has been prosecuting the instant application in the U.S., Applicant has obtained claim allowance in Great Britain, Germany, Australia, India, Canada, Mexico and anticipates in Japan. Applicant further obtained an Office Action indicating allowance in The Russian Federation; however, due to funds,

Applicant had to let the application in Russia go abandoned. THESE ARE COMPETENT AUTHORITIES. Applicant respectfully presents to the Examiner that all of the aforementioned jurisdictions cannot be incorrect.

Examiner Argument

In this Office Action, the Examiner withdraws the rejections of dependent claims 225-227, 237, 241-242.

Applicant's Response

Applicant appreciates time of the Examiner to review Applicant's Response and formulate his argument. Applicant thanks the Examiner for withdrawing his rejections of dependent claims 225-227, 237, and 241-242.

Examiner Argument

Applicant argued on page 8 of this amendment, "1) Tindell does not teach the combustion of water, water is not combustible". It appears Applicant misunderstands the Examiner's statement. What the Examiner meant was water was injected into the combustion chamber of Tindell. This is exactly recited in the claimed invention. Note claim 216.

Applicant's Response

Applicant respectfully presents to the Examiner that, given the nature of these proceedings, Applicant must work from statements of the Examiner as those statements are made. Applicant appreciates clarification by the Examiner.

Examiner Argument

Applicant argued "2) Penfornis requires flue gas from combustion ..". The Examiner agrees with that but fails to understand why that could invalidate the 103 rejection.

Applicant argued on page 9 "3) Penfornis, et al. cannot function without flue gas from combustion, and 4) the instant claims [do] not comprise flue gas from combustion".

Please note it does not matter if the claims recite the flue gas or not, as long as the applied references teach all the claimed subject matter, the rejection is valid.

Applicant argued "the instant claim comprises either rotating mechanical energy or steam from combustion (torque and H₂O are not flue gas) from combustion to power air separation". As best understood, Applicant argued that Penfornis does not use steam or mechanical energy to drive the air separation system. This argument is fatally erroneous. Note column 6, lines 1-9, Penfornis states "Mechanical power produced by steam turbine 22 is used either to generate shaft power via shaft 25 ... Preferably, the mechanical power is used to drive compressor 2, thereby reducing a power consumption of the air separation system 4". Note the compressor 2 is part of the air separation system 4. Penfornis clearly states as noted above that the mechanical energy drive the compressor, and said mechanical energy is from the steam turbine. This is EXACTLY what Applicant recites in his claims.

Applicant argued "Penfornis teaches use of a "flue gas" from combustion to produce heated steam". As best understood, Applicant argued that the flue gas is driving the steam cycle. Please note the combustion chamber with water is already taught in Tindell. Note combustion chamber 33 with water nozzle 31 in Tindell.

Penfornis is relied upon to teach the separation unit and the concept that the mechanical energy of the steam turbine is used to drive the air separation unit. In this Office Action, the Examiner modifies the wording of the rejection to remove the flue gas if Applicant has problem with the flue gas.

Applicant's Response

Applicant appreciates time of the Examiner to review Applicant's Response and formulate the Examiner's argument. Applicant has further amended instant independent claim 216 such that there is no way one could interpret the many steps and equipment of Penfornis et al. as instant independent claim 216:

216. An engine comprising a combustion chamber, wherein
a mixture of oxygen, as O₂, and hydrogen, as H₂, is combusted, creating steam,
wherein

at least a portion of the oxygen is obtained by the separation of air, wherein the separation of air is selected from the group consisting of:

- (a) cryogenic separation,
 - (b) membrane separation,
 - (c) pressure swing adsorption, and
- any combination thereof, wherein

the air separation is at least partially powered by torque or mechanical rotating energy, wherein

the torque or mechanical rotating energy is at least partially obtained from at least one of:

- the steam turning a steam turbine,
 - the steam in the combustion chamber driving a piston,
 - the steam in the combustion chamber driving a steam turbine, and
- any combination therein, and wherein

the temperature of combustion is at least partially controlled with the addition of water or steam to the combustion chamber in a way that maintains the temperature of combustion or of combustion exhaust.

Therefore, the instant independent claim now requires torque or mechanical rotating energy to power air separation; wherein the torque or mechanical rotating energy is at least partially obtained from at least one of: the steam turning a steam turbine, the steam in the combustion chamber driving a piston, the steam in the combustion chamber driving a steam turbine, and any combination therein. These claim limitations are NOT TAUGHT or SUGGESTED in Penfornis, et al. and cannot be; as, Penfornis, et al. require combustion of a hydrocarbon; while, the instant claim, in strong contrast, combusts hydrogen, therein DIRECTLY producing either torque, mechanical rotating energy or steam, as taught in the instant specification.

Applicant has respectfully traversed the Examiners rejection of instant independent claim 216. Applicant respectfully requests an allowance of instant independent claim 216, as amended herein, along with, all claims which depend upon instant independent claim 216.

Examiner Argument

The Examiner states that “he fails to see” where declarants Walker and Vaughan provide any supportive evidence; the Examiner states that the declarations are conclusory.

Applicant’s Response

Applicant respectfully presents to the Examiner that the Walker and Vaughan declarations refer to the instant claims. Specifically, paragraph 15 of the Walker declaration states “I have reviewed the pending claims as of this date within U.S. Patent Application 10/790,316 and compared with the prior art cited by the Patent Examiner... I do not find this prior art cited by the Patent Examiner to have made the pending claims within U.S. Patent Application 10/790,316 as obvious. In fact, I find Penfornis et al. and Wallace et al. as improvements upon existing hydrocarbon processes; whereas, the Haase Application is a new and different process. In many instances, I find the art cited by the Patent Examiner to lead one away from the pending claims within U.S. Pat. Application 10/790,316.”

Further, Mr. Walker states in paragraph 11 of his May 1, 2009 declaration “As I have read and understand the invention claims of Mr. Haase within U.S. Patent Application 10/790,316, which propose a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to separate air to provide the pure form of oxygen to combustion. It is my understanding and belief that this teaching will increase the amount of hydrogen and of oxygen in the combustion chamber, thereby improving available torque per cubic inch of combustion chamber previous. It is my opinion that this teaching and the claims thereupon are non-obvious without the teachings of the styled patent application while answering a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity”.

Further also, Mr. Walker states in paragraph 14 of his May 1, 2009 declaration “As combustion methods, engines and devices comprise a significant market and as there exist many marketed devices within the combustion, engine and turbo-machinery industries in combination with a [worldwide knowledge] of the environmental consequences of hydrocarbon combustion methods, there should not previously nor today exist any lack of interest or lack of appreciation of an invention's potential or marketability to a method or apparatus as presented and claimed in the invention of Mr. Haase, U.S. Patent Application 10/348,071”.

Mr. Chester Vaughan states in paragraph 4 of his December 2, 2009 declaration “Based on my experience, I believe I should be viewed as someone of expert skill in the art of combustion science and engineering. ***Based on my review of Mr. Haase’s pending claims,***

as evidenced in Exhibit A, I believe that the pending claims of this patent comprise a novel approach which would satisfy a long felt need for humanity”.

Further also still, Mr. Chester Vaughan states in paragraph 5 of his December 2, 2009 declaration “My decision that Mr. Haase’s pending claims answer a long felt need of humanity is first based upon the fact that prior to and subsequent to Mr. Haase’s pending claims, there is no solution within the art for a combustion engine which would operate without the production of oxides of carbon. There is a long felt need for a combustion engine which would operate without the production of oxides of carbon and which provides adequate power and/or torque per displacement. As is known by most of humanity, global climate change is a significant threat to life as is known today; therefore, the long felt need of a combustion engine which would operate without the production of oxides of carbon has been a persistent and well known long felt need for those in the art and has been known by those of ordinary skill in the art.”

Further still also, Mr. Chester Vaughan states in paragraph 6 of his December 2, 2009 declaration “My decision that Mr. Haase’s pending claims answer a long felt need of humanity is second based upon the fact that no one else prior to or since Mr. Haase’s pending claims has satisfied humanity’s long felt need for a combustion engine which would operate without the production of oxides of carbon and which would provide adequate power and/or torque.”

Further yet still also, Mr. Chester Vaughan states in paragraph 7 of his December 2, 2009 declaration “My decision that Mr. Haase’s pending claims answer a long felt need of humanity is third based on my belief that application of Mr. Haase’s pending claims, along with knowledge of those of ordinary skill in the art, will answer the long felt need of humanity for a combustion engine which operates without the production of oxides of carbon and which would provide adequate power or torque”.

Further still yet also, Mr. Chester Vaughan states in paragraph 8 of his December 2, 2009 declaration “As claimed by Mr. Haase, the use of pure Oxygen instead of air eliminates the dilution effect of nitrogen which allows significant lower peak combustion pressure for the same torque when compared with the current internal combustion engines (or higher torque with comparable peak combustion pressure). While, the industry has recently pursued and is pursuing, options such as pollution control equipment on the current Internal combustion engines, battery and fuel cell electric motor driven systems (including hybrids) to deal with this long felt need for humanity, all of these pursuits have significant disadvantages when compared with the concept described and claimed by Mr. Haase in his patent application (U.S. Patent Application 10/790,316).”

Further still yet also, Mr. Chester Vaughan states in paragraph 9 of his December 2, 2009 declaration “As combustion methods, engines and devices is a significant market and as there exist many marketed devices within the combustion, engine and turbo-machinery industries in combination with a [worldwide] knowledge of the environmental consequences of hydrocarbon combustion methods, there should not previously nor today exist any lack of interest or lack of appreciation of an invention's potential or marketability to a method or apparatus as claimed and presented in U.S. Patent Application 10/348,071.”

Applicant respectfully refers the Examiner to the declaration of Colin Walker dated May 1, 2009 and to the declaration of Mr. Chester Vaughan dated December 2, 2009. Applicant respectfully presents to the Examiner that these declarations of Mr. Walker and Mr. Vaughan demonstrate proper evidence pursuant to MPEP § 716 and Federal Circuit Case Law.

Examiner Argument

The Examiner has argued against the statement of GIM Resources, for which Applicant believes demonstrates significant skepticism and disbelief. The Examiner states that “Nothing about the claimed invention of this application was mentioned”.

Applicant's Response

Applicant respectfully states that the patent was mentioned in the statement of Element Markets. Specifically, the report of Element Markets states “Unfortunately, *the patent application* primarily demonstrates a complete lack of understanding by the inventor of the thermodynamics of existing fossil fuel/air combustion engines as well as a lack of understanding of the thermodynamics of the proposed invention...I suggest that Element Markets not pursue this technology.” (Emphasis added)

Therefore, Applicant respectfully states to the Examiner that “the patent application” and the teachings therein which support the instant claims were specifically mentioned.

Applicant Refers to MPEP 716.01

For the Examiner, Applicant specifically refers to MPEP 716.01 (c):

I. Objective Evidence Should be Supported by Actual Proof

Objective evidence which must be factually supported by an appropriate affidavit or declaration to be of probative value includes evidence of unexpected results, commercial success, solution of a long-felt need, inoperability of the prior art, invention before the date of the reference, and allegations that the author(s) of the prior art derived the disclosed subject matter

from the applicant. See, for example, *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984) (“It is well settled that unexpected results must be established by factual evidence.” “[A]ppellants have not presented any experimental data showing that prior heat-shrinkable articles split. Due to the absence of tests comparing appellant’s heat shrinkable articles with those of the closest prior art, we conclude that appellant’s assertions of unexpected results constitute mere argument.”). See also *In re Lindner*, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1972); *Ex parte George*, 21 USPQ2d 1058 (Bd. Pat. App. & Inter. 1991).

III. Opinion Evidence

Although factual evidence is preferable to opinion testimony, such testimony is entitled to consideration and some weight so long as the opinion is not on the ultimate legal conclusion at issue. While an opinion as to a legal conclusion is not entitled to any weight, the underlying basis for the opinion may be persuasive. *In re Chilowsky*, 306 F.2d 908, 134 USPQ 515 (CCPA 1962) (expert opinion that an application meets the requirements of 35 U.S.C. 112 is not entitled to any weight; however, facts supporting a basis for deciding that the specification complies with 35 U.S.C. 112 are entitled to some weight); *In re Lindell*, 385 F.2d 453, 155 USPQ 521 (CCPA 1967) (Although an affiant’s or declarant’s opinion on the ultimate legal issue is not evidence in the case, “some weight ought to be given to a persuasively supported statement of one skilled in the art on what was not obvious to him.” 385 F.2d at 456, 155 USPQ at 524 (emphasis in original)).

In assessing the probative value of an expert opinion, the examiner must consider the nature of the matter sought to be established, the strength of any opposing evidence, the interest of the expert in the outcome of the case, and the presence or absence of factual support for the expert’s opinion. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 227 USPQ 657 (Fed. Cir. 1985), *cert. denied*, 475 U.S. 1017 (1986). See also *In re Oelrich*, 579 F.2d 86, 198 USPQ 210 (CCPA 1978) (factually based expert opinions on the level of ordinary skill in the art were sufficient to rebut the *prima facie* case of obviousness); *Ex parte Gray*, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989) (statement in publication dismissing the “preliminary identification of a human b-NGF-like molecule” in the prior art, even if considered to be an expert opinion, was inadequate to overcome the rejection based on that prior art because there was no factual evidence supporting the statement); *In re Carroll*, 601 F.2d 1184, 202 USPQ 571 (CCPA 1979) (expert opinion on what the prior art taught, supported by documentary evidence and formulated prior to the making of the claimed invention, received considerable deference); *In re Beattie*, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992) (declarations of seven persons skilled in the art offering opinion evidence praising the merits of the claimed invention were found to have little value because of a lack of factual support); *Ex parte George*, 21 USPQ2d 1058 (Bd. Pat. App. & Inter. 1991) (conclusory statements that results were “unexpected,” unsupported by objective factual evidence, were considered but were not found to be of substantial evidentiary value).

Although an affidavit or declaration which states only conclusions may have some probative value, such an affidavit or declaration may have little weight when considered in light of all the evidence of record in the application. *In re Brandstadter*, 484 F.2d 1395, 179 USPQ 286 (CCPA 1973).

Therefore, Applicant respectfully presents to the Examiner that according to MPEP § 716.01

(c) (I) “Objective evidence which must be factually supported by an appropriate affidavit or declaration to be of probative value includes evidence of unexpected results, commercial success, solution of a long-felt need”. As previously presented by Applicant, declarants Walker and Vaughan so provide to the Examiner in regard to Long Felt Need. Applicant respectfully

presents to the Examiner that Mr. Walker states in § 11 of his May 1, 2009 declaration "As I have read and understand the invention claims of Mr. Haase within U.S. Patent Application 10/790,316, which propose a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to separate air to provide the pure form of oxygen to combustion. It is my understanding and belief that this teaching will increase the amount of hydrogen and of oxygen in the combustion chamber, thereby improving available torque per cubic inch of combustion chamber previous. It is my opinion that this teaching and the claims thereupon are non-obvious without the teachings of the styled patent application while answering a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity." These are not conclusory or opinion statements; these are factual statements.

Further, Applicant presents to the Examiner that Mr. Vaughan states in § 8 of his May 1, 2009 declaration:

8. As claimed by Mr. Haase, the use of pure Oxygen instead of air eliminates the dilution effect of nitrogen which allows significant lower peak combustion pressure for the same torque when compared with the current internal combustion engines (or higher torque with comparable peak combustion pressure). While, the industry has recently pursued and is pursuing, options such as pollution control equipment on the current Internal combustion engines, battery and fuel cell electric motor driven systems (including hybrids) to deal with this long felt need for humanity, all of these pursuits have significant disadvantages when compared with the concept described and claimed by Mr. Haase in his patent application (U. S. Patent Application 10/790,316). The following is a more detailed discussion of the pertinent features and benefits of the patent:
 - a. A method of hydrogen combustion which produces no oxides of carbon and no oxides of nitrogen has been a long felt need of humanity; no solution has been previously presented. Previous and on-going attempts of others to solve this long felt need include, but are not limited to, fuel cells, batteries and electric motors and the combustion of hydrogen with air. Fuel cells, utilizing air for its source of oxygen, are less desirable due to many factors including, but not limited to: equipment cost, platinum availability, and the production of oxides of nitrogen. Combustion of hydrogen with air is proving a challenge due to the production of oxides of nitrogen and due to the available torque per cubic inch of displacement. This is all while the environmental consequences increase daily of humanity's combustion of hydrocarbon fuel. I would also state that said long felt industry need has been known by those of ordinary skill in the art, as well as those of expert skill in the art, of combustion engines and of combustion furnaces for a considerable time previous to the priority date of Mr. Haase's patent application, U.S. Patent Application 10/790,316.
 - b. A method of hydrogen combustion which produces little to no oxides of carbon nor of nitrogen has been a long felt need which has been known by those or ordinary and of expert skill in the art of combustion and of turbo-machinery for many years, wherein there has not been previously presented a solution.

- c. At this time, there is no known method or apparatus to combust hydrogen with a pure form of oxygen without storage of oxygen, a rather combustible and dangerous material to store.
- d. I would state that a method or apparatus to combust hydrogen with a pure form of oxygen, as claimed, answers said long felt need.
- e. As I have read and understand in the claims, the invention of Mr. Haase, U.S. Patent Application 10/790,316, proposes a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to cryogenically distill air as a means to provide a pure form of oxygen to combustion. It is my opinion that this technique and the claims therein answer a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity.
- f. As I have read and understand in the claims, the invention of Mr. Haase, U.S. Patent Application 10/790,316, proposes a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to cryogenically distill air to provide a pure form of oxygen to combustion. It is my understanding that this approach will increase the amount of hydrogen and of oxygen in the combustion chamber, thereby improving available torque per cubic inch of combustion chamber. It is my opinion that this technique and the claims therein answer a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity.
- g. As I have read and understand the claims, the invention of Mr. Haase, U.S. Patent Application 10/790,316, proposes a method and an apparatus to combust a pure form of hydrogen with a pure form of oxygen, wherein a portion of the combustion energy is used to cryogenically distill air to provide a pure form of oxygen to combustion while using the available cryogenic nitrogen as a means of reducing the temperature of stored hydrogen to a temperature below the joule Thompson curve of hydrogen, thereby improving the storage effectiveness of hydrogen. It is my opinion that this approach and the claims therein answer a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity.
- h. As I have read and understand the claims, the invention of Mr. Haase, U.S. Patent Application 10/790,316, the techniques and methods discussed above, including the benefits can be applied to jet engines, e.g. turbo-machinery. It is my opinion that this technique and the claims therein answer a long felt industry need known by those of ordinary and of expert skill in the art, as well as a long felt need of humanity.
- i. While the invention and apparatus claimed and described by Mr. Haase within U.S. Patent Application 10/790.316 represents significant advantages over current approaches and pursuits, the description also represent some development and integration challenges including startup transients which must be overcome to be successful. However, with advances in materials and technology, etc., I believe the patent should be granted and the concept developed.

Again, these are not these as conclusory or opinion statements; these are factual statements.

Each of these distinguished declarants executed their respective declaration upon their thorough review of the instant application, the instant claims and citations of the Examiner as so

indicated and of their own volition.

Further, in regard to the declarants and their efficacy in this proceeding, Applicant refers to MPEP 716.01(a):

Affidavits or declarations, when timely presented, containing evidence of criticality or unexpected results, commercial success, long-felt but unsolved needs, failure of others, skepticism of experts, etc., must be considered by the examiner in determining the issue of obviousness of claims for patentability under 35 U.S.C. 103. The Court of Appeals for the Federal Circuit stated in *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538, 218 USPQ 871, 879 (Fed. Cir. 1983) that "evidence rising out of the so-called 'secondary considerations' must always when present be considered en route to a determination of obviousness." Such evidence might give light to circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or unobviousness, such evidence may have relevancy. *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966); *In re Palmer*, 451 F.2d 1100, 172 USPQ 126 (CCPA 1971); *In re Fielder*, 471 F.2d 640, 176 USPQ 300 (CCPA 1973). The *Graham v. John Deere* pronouncements on the relevance of commercial success, etc. to a determination of obviousness were not negated in *Sakraida v. Ag Pro*, 425 U.S. 273, 189 USPQ 449 (1979) or *Anderson's-Black Rock Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 163 USPQ 673 (1969), where reliance was placed upon *A&P Tea Co. v. Supermarket Corp.*, 340 U.S. 147, 87 USPQ 303 (1950). See *Dann v. Johnston*, 425 U.S. 219, 226 n.4, 189 USPQ 257, 261 n. 4 (1976).

Examiners must consider comparative data in the specification which is intended to illustrate the claimed invention in reaching a conclusion with regard to the obviousness of the claims. *In re Margolis*, 785 F.2d 1029, 228 USPQ 940 (Fed. Cir. 1986). The lack of objective evidence of nonobviousness does not weigh in favor of obviousness. *Miles Labs. Inc. v. Shandon Inc.*, 997 F.2d 870, 878, 27 USPQ2d 1123, 1129 (Fed. Cir. 1993), *cert. denied*, 127 L. Ed. 232 (1994). However, where a *prima facie* case of obviousness is established, the failure to provide rebuttal evidence is dispositive.

Examiner Rejection

Claims 216-220, 222, 224, 231, 235, 238-240, 243, 248-253, 258, 342, are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.).

Applicant's Response

Applicant appreciates time afforded by the Examiner to formulate his rejection.

Applicant within the foregoing argument and amendment has respectfully traversed the Examiner's Rejection. Applicant respectfully requests allowance of claims 216-220, 222, 224, 231, 235, 238-240, 243, 248-253, 258 and 342, as amended herein.

Examiner Rejection

Claim 223 is rejected under 35 U.S.C. 103(a) as unpatentable over US 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 6588212 (Wallace et al.).

Applicant's Response

Applicant appreciates time afforded by the Examiner to formulate his rejection.

Applicant respectfully presents that Applicant has respectfully traversed the Examiner's Rejection of instant independent claim 216, the claim from which instant dependent claim 223 depends. Therefore, instant dependent claim 223 is allowable. Applicant respectfully requests allowance of instant dependent claim 223 as presented herein.

Examiner Rejection

Claims 231, 235 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 5516359 (Kang et al.).

Applicant's Response

Applicant appreciates time afforded by the Examiner to formulate his rejection.

Applicant respectfully presents to the Examiner that there is no claim limitation within either instant dependent claim 231 or instant dependent claim 235 for a membrane; therefore, the Examiner's Rejection is moot. Applicant respectfully requests allowance of instant dependent claims 231 and 235 as presented herein.

Examiner Rejection

Claims 259-260, 350 are rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 6212876 (Gregory et al.).

Applicant's Response

Applicant appreciates time afforded by the Examiner to formulate his rejection.

Applicant respectfully presents that Applicant has respectfully traversed the Examiner's Rejection of instant independent claim 216, the claim from which instant dependent claims 259-260 depend. Therefore, instant dependent claims 259-260 are allowable. Applicant respectfully requests allowance of instant dependent claims 259-260 as presented herein.

Applicant respectfully presents to the Examiner that there is no teaching of hydrogen thermodynamics in Gregory et al., which would teach or suggest instant dependent claim 350.

Should there be such in Gregory et al. and Applicant missed, Applicant respectfully asks the Examiner to provide such teaching and/or suggestion. Otherwise, Applicant has traversed the Examiner's Rejection of instant dependent claim 350. Applicant respectfully requests allowance of instant dependent claim 350 as presented herein.

Examiner Rejection

Claims 244-247 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 4841731 (Tindell) in view of U.S. 7062912 (Penfornis et al.) and U.S. 6698183 (Thordarson).

Applicant's Response

Applicant appreciates time afforded by the Examiner to formulate his rejection.

In regard to instant dependent claims 244 and 245, Applicant respectfully presents to the Examiner that Applicant has respectfully traversed the instant independent claim from which instant dependent claims 244-247 depend, namely instant dependent claim 216. Therefore, instant dependent claims 244-247 are allowable. Applicant respectfully requests allowance of instant dependent claims 244-247, as presented herein.

Identification of the Source of the Problem

Finally, Applicant respectfully presents to the Examiner that Applicant has identified a solution to a significant challenge of humanity by identifying the "source of the problem" (ref. MPEP 2141.02 III, IV) for which others have expended significant effort. This is evidenced within the instant specification §§ 002-005, 010-021, 041-054, 056-063, and 102-104, as well as the abstract. This is also evidenced within the declaration of Mr. Christopher Vaughan in § 8, as well as within the declaration of Mr. Walker in §§ 15-18.

Claim Allowance

Applicant respectfully requests allowance of claims 216-220, 222-229, 231-232, 235, 237-253, 258-260, 342 and 350, as presented herein.

CONCLUSION

In view of the foregoing, Applicant believes that the claims, as presented, are in order for allowance; Applicant respectfully requests favorable reconsideration of this response and amendment, as well as allowance of the instant claims at the earliest opportunity.

Applicant has respectfully presented to the Examiner that the citations **do not teach all of the instant claim limitations**.

Applicant has also respectfully presented to the Examiner that the cited combinations do not present or teach a solution to **the source of the problem, e.g. production of oxides of carbon and of nitrogen**, as has Applicant.

In support of Applicant's Argument, Applicant has further respectfully presented secondary considerations in the form of two declarations, one from a person of expert skill in the art and one from a person of ordinary skill in the art, both of which demonstrate that the instant invention and the instant invention claims **answer a long felt and unresolved need of humanity**, which has been recognized by those of ordinary skill in the art for some time and which was not answered prior to the filing of the instant invention.

Further, Applicant has further still presented **skepticism and/or disbelief to the instant invention**, as claimed, from two of expert skill in the art, one at the US DOD and one consultant.

Applicant appreciates the time and effort afforded by the Examiner in the prosecution of the instant claims for the instant invention.

As Applicant has respectfully traversed all of the Examiner's rejections, Applicant herein requests the award certificate for the instant claims as amended and presented herein.

Respectfully submitted,



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